
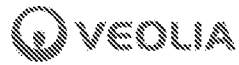


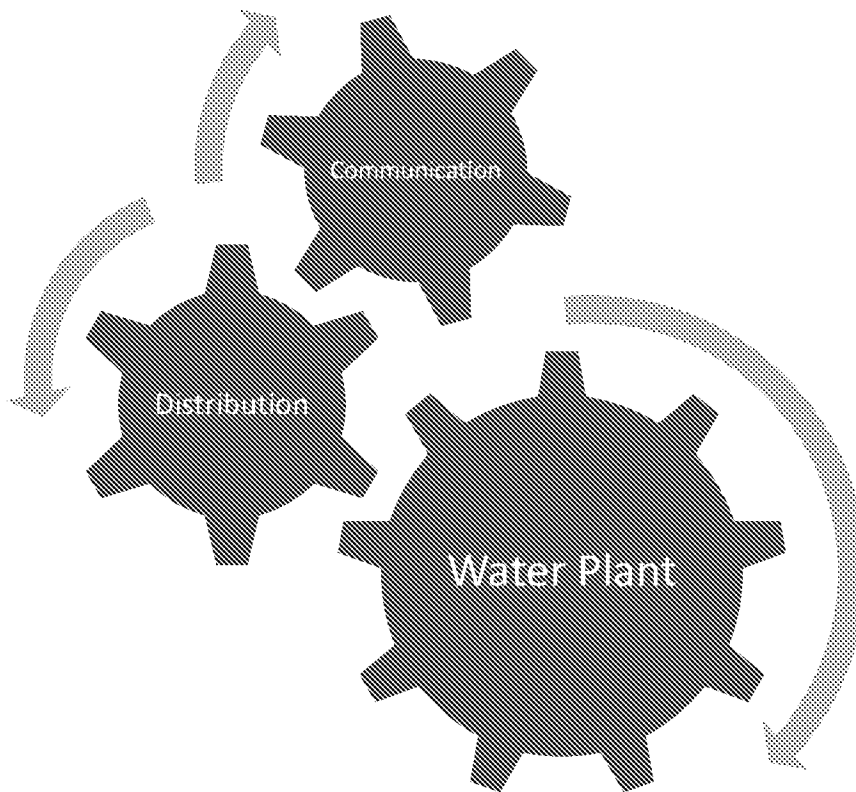
# EXHIBIT 53

A black and white photograph of the Flint, Michigan skyline. The image shows several large industrial or commercial buildings along a waterfront. A prominent building in the center has a tall, thin tower with a spherical top. The foreground is dark and appears to be water or a wet surface, reflecting the buildings. The sky is light and overcast.

# **City of Flint, MI Water Quality Report**

## **Technical Advisory Committee**

# Solution Involves Coordination of 3 Activities



- **Water plant improvements**

- *Optimize chemical dosages*
- *Consider different chemicals*
- *Install granulated activated carbon*
- *Complete plant upgrades*
- *Implement best mgt practices*

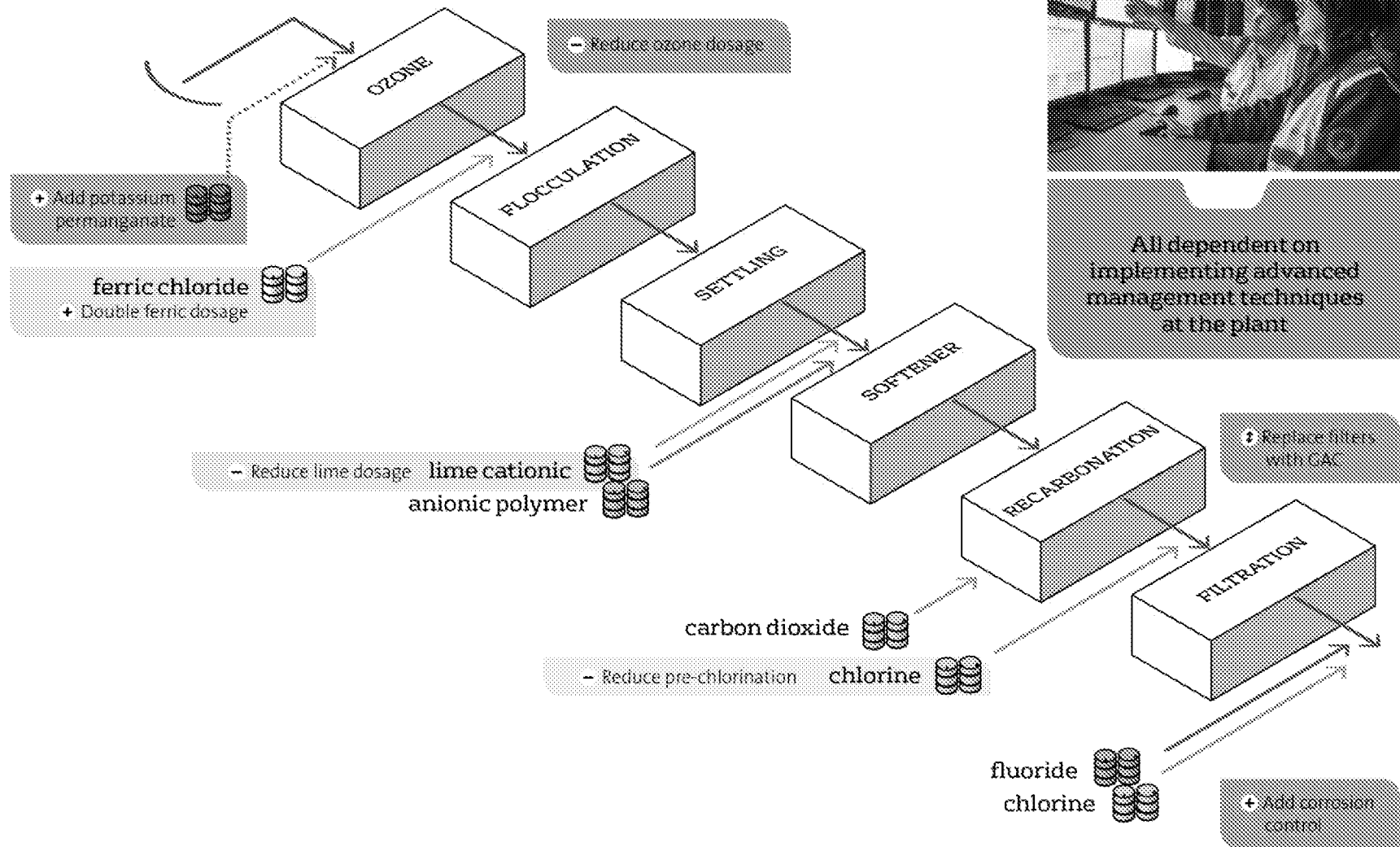
- **Distribution system improvements**

- *Fix broken valves*
- *Ask for customer feedback*
- *Reduce tank storage*
- *Target line flushing*
- *Run a hydraulic model*

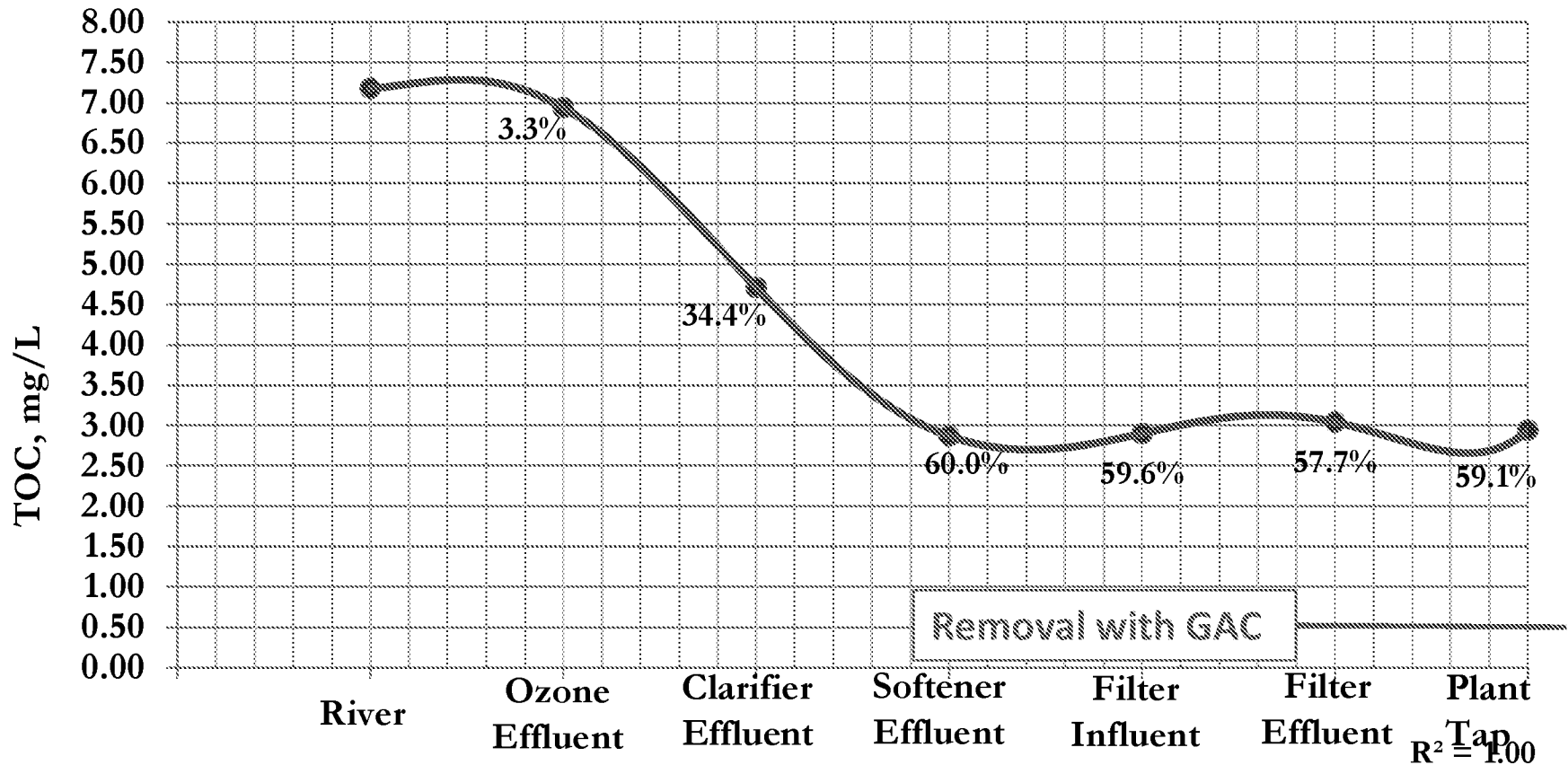
- **Better communication with customers**

- *Engage advisory committees*
- *More accessible utility*
- *Make it easy to access information*
- *Better customer communication*

# Optimize Plant Processes

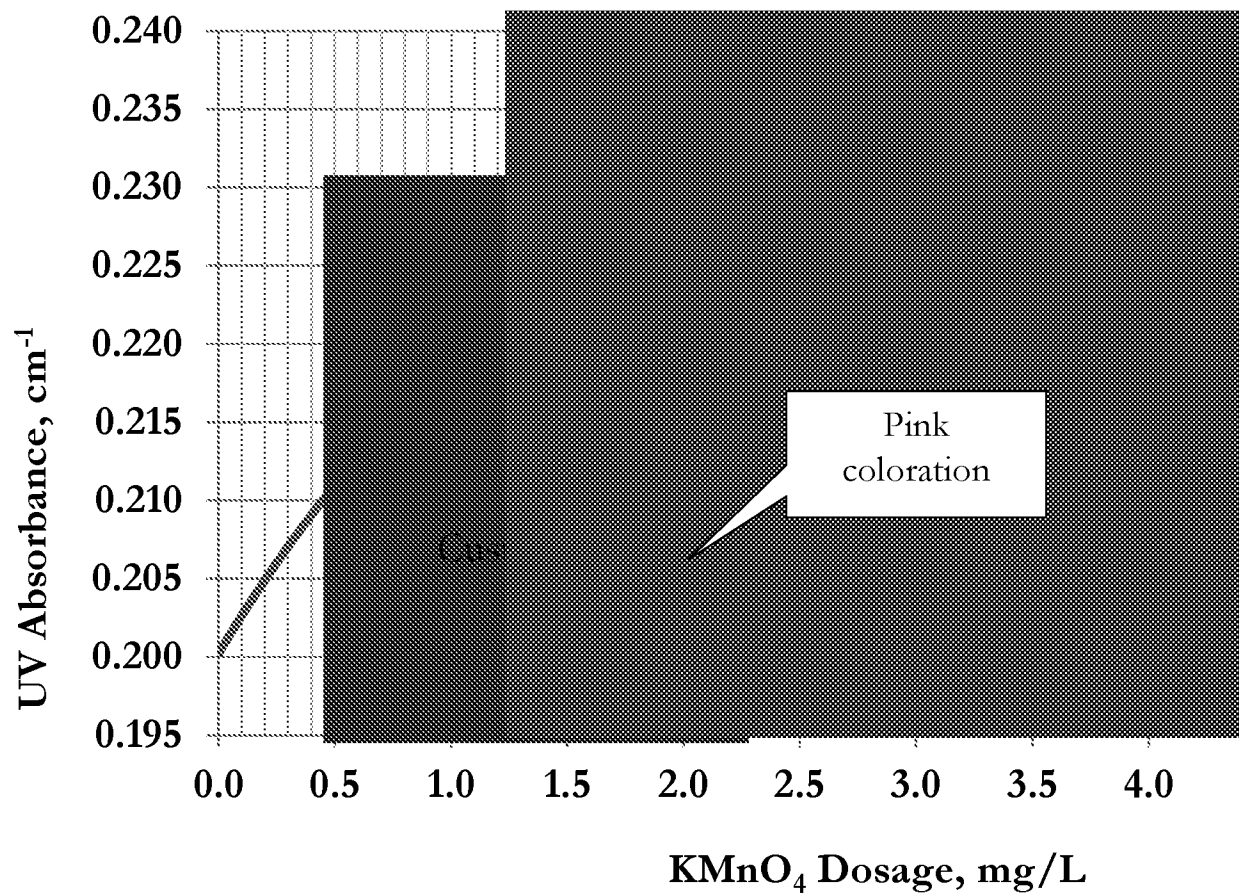


# TOC Removal Efficiency Optimizing Current Plant



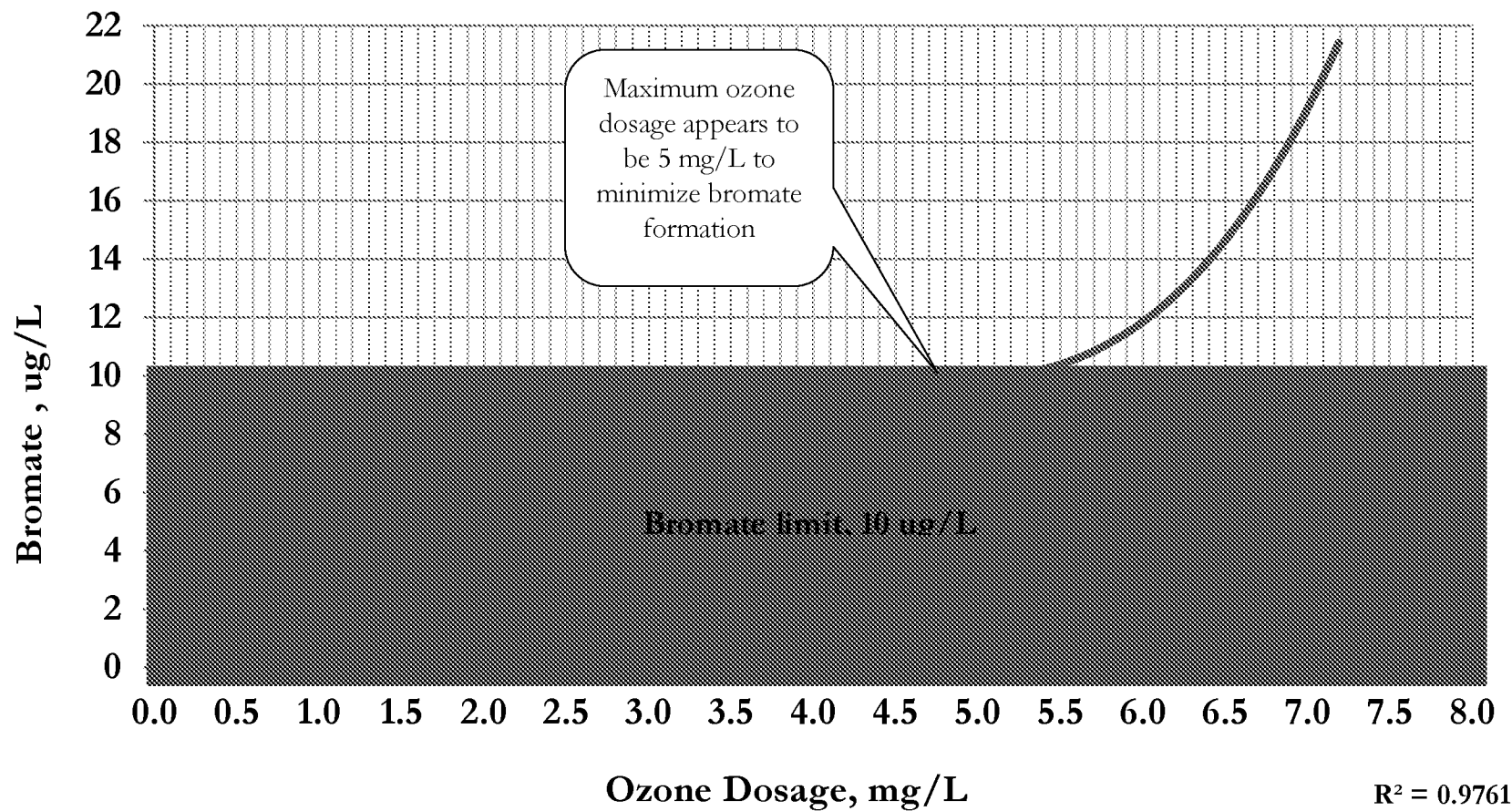


# Potassium Permanganate Dosing Graph

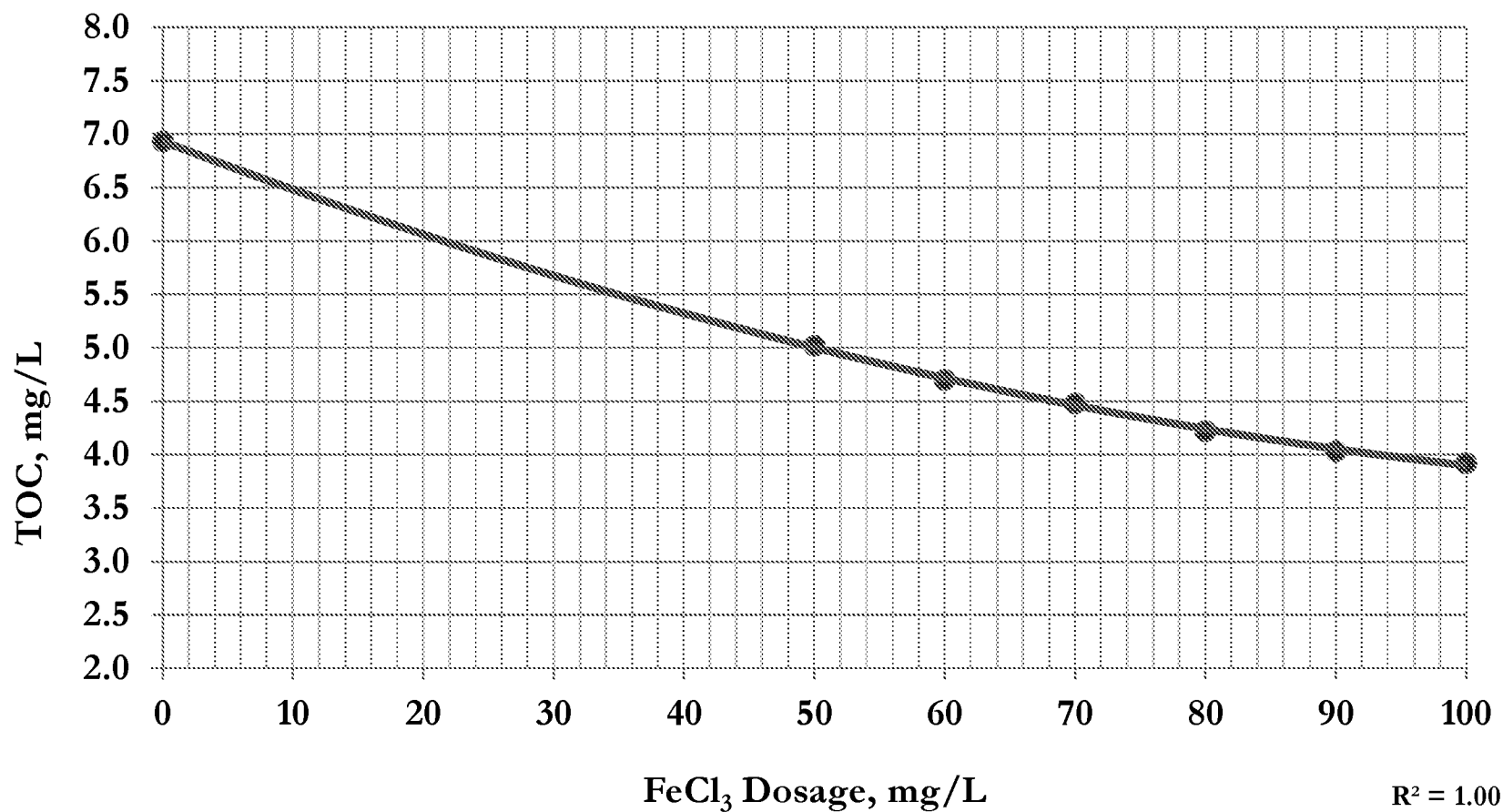

 $R^2 = 0.9753$ 

JAR TEST BENCH SHEET										1
FACILITY NAME	Flint, Michigan				DATE	February 16, 2015				
CHEMICAL DATA		ALUM	FeCl <sub>3</sub>	Fe <sub>2</sub> (SO <sub>4</sub> ) <sub>3</sub>	POLYMER	LIME	KMnO <sub>4</sub>			
Specific gravity							1.16			
Percent dry chemical							20			
Stock volume, mL							100			
Chemical added, mL or grams							0.9			
Stock concentration, mg/L							2,000			
Solution volume, mL										
Stock solution added, mL										
Solution concentration, mg/L										
TEST										
CONDITION										
Stirrer RPM	300		DURATION		seconds		0	seconds		0
Rapid Mixing							6			sec
Flocculation	30		15		minutes		6			min
Settling	0						Coag. 0.3			gpm/ft
Filtered distilled water time							Soft. 1.15			gpm/ft
RAW WATER CHARACTERISTICS										
Temperature °C	pH	Alkalinity	Hardness	Turbidity	Color	TOC	DOC	POC		
						7.05				
Filterability Index	Calcium	Magnesium	Iron	Manganese	THMP	UV <sub>254</sub>				
						0.138				
JAR NUMBER	1	2	3	4	5	6				
Raw water volume, mL	2,000	2,000	2,000	2,000	2,000	2,000				
Alum solution added, mL										
Alum dosage, mg/L										
Ferric solution added, mL										
Ferric dosage, mg/L										
Polymer solution added, mL										
Polymer dosage, mg/L										
KMnO <sub>4</sub> solution added, mL	0.5	1.5	2.5	3.5	4.5	5.5				
KMnO <sub>4</sub> dosage, mg/L	0.5	1.5	2.5	3.5	4.5	5.5				
Lime solution added, mL										
Lime dosage, mg/L										
FLOCCULATION OBSERVATIONS										
5 minutes										
10 minutes										
15 minutes										
20 minutes										
25 minutes										
SETTLING CHARACTERISTICS OBSERVATIONS										
1 minute										
2 minutes										
3 minutes										
4 minutes										
6 minutes										
SETTLED WATER RESULTS										
Turbidity, NTU										
Water pH										
Alkalinity, mg/L										
Hardness, mg/L										
TOC, mg/L										
UV <sub>254</sub> , cm <sup>-1</sup>	0.215	0.222	0.228	0.230	0.232	0.237				
Filtered water time										
Filterability Index										
NOTES										

# Bromate Dosing Graph

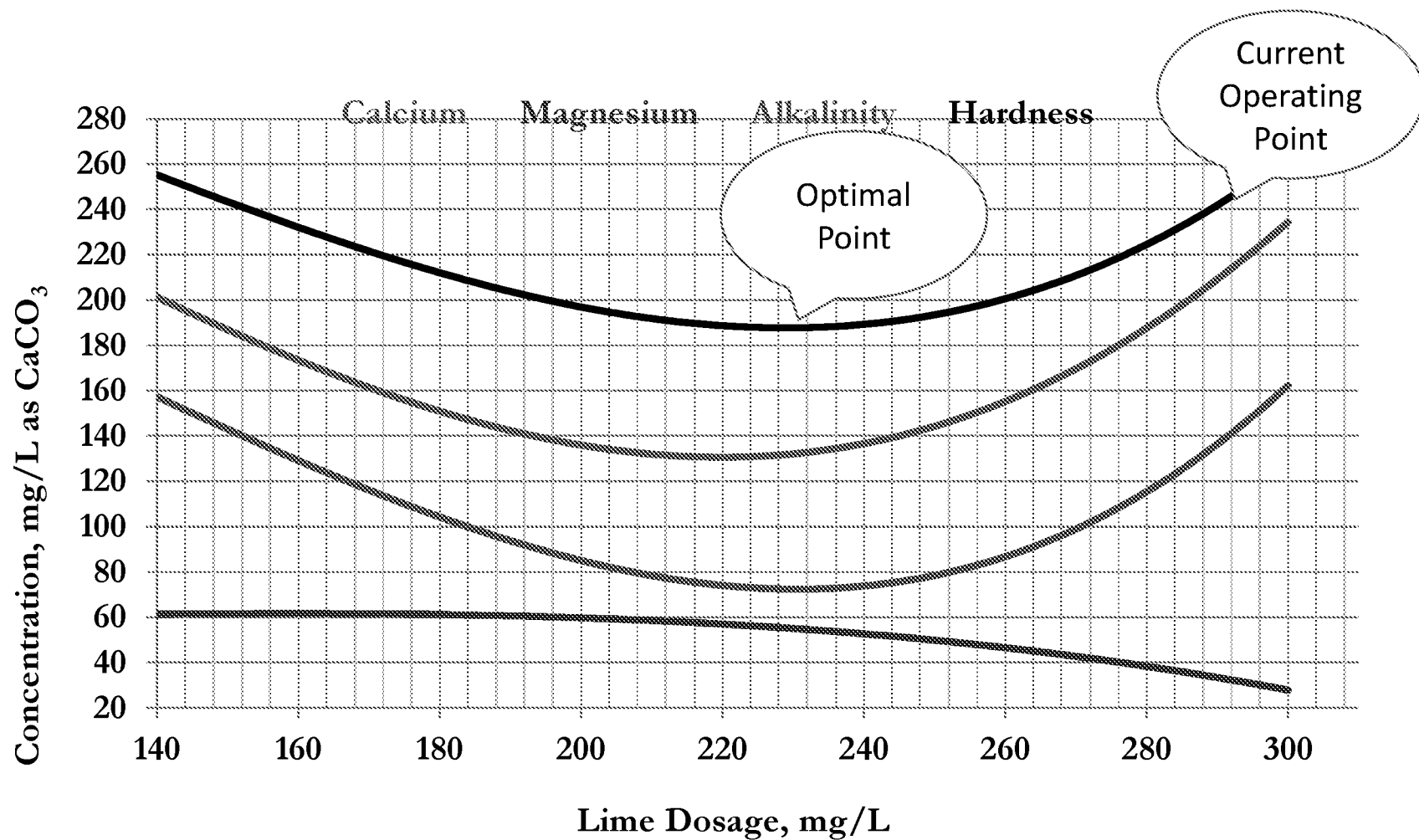


# Dosage of Ferric Chloride





# Lime Dosage Graph



# Implement Best Management Practices

## Activities to Help Operators Maintain Good Water Quality

- Process Control Management Plan
- Lab QA/QC Program
- Computerized Maintenance Management System
- Asset Management System
- Training and Certification Program
- Vulnerability Plan

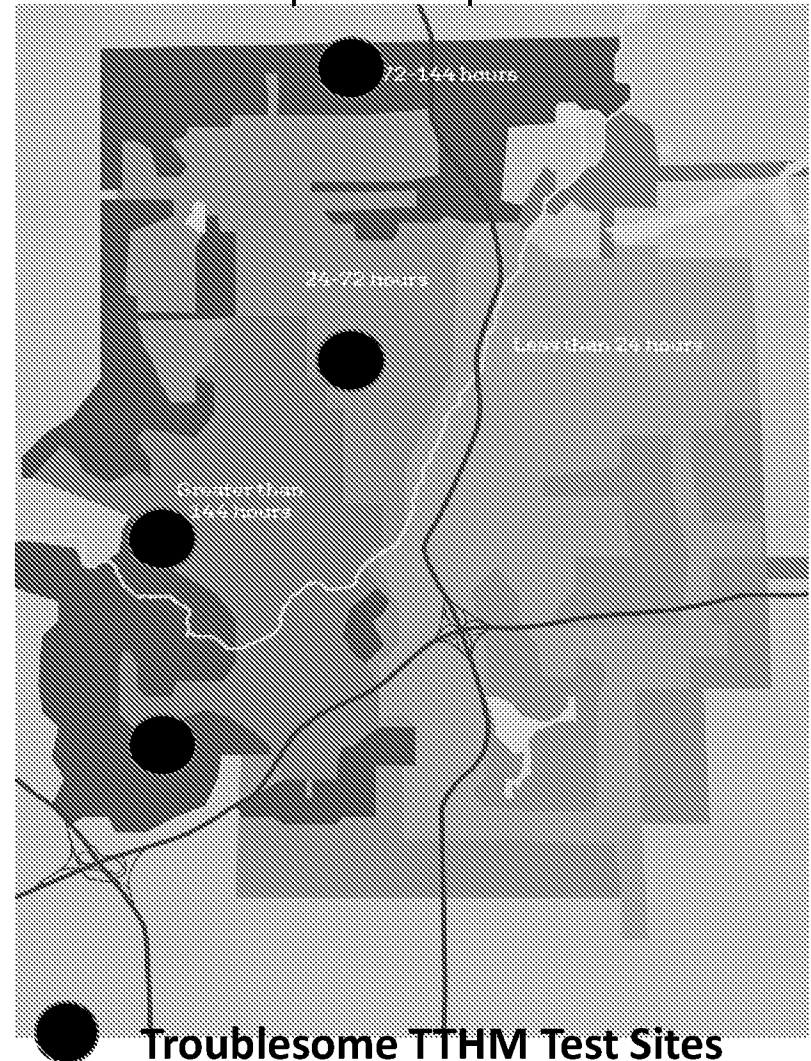


# Water Age Map

- Speed up flow of water from plant to homes – 2 weeks plant to house
  - Find closed valves & open them
  - Replace broken valves
  - Update hydraulic model
  - Reduce system storage
- Track customer complaints
  - Test customer water
  - Spot flush hydrants to clean areas of stagnant water in the system



## Conceptual Map



Troublesome TTHM Test Sites

# Make It Easy to Access Information and People

## **Develop a proactive customer communication plan**

- Create advisory committees to help direct efforts and improve flow of information
- Add additional communication personnel for the utility
- Develop a pro active communication program
- Establish a single point of contact to manage all water quality complaints
- Provide additional customer service training and tools to staff
- Expand neighborhood and community outreach
- Change monthly billing statements from card to envelope with information



Questions?